

# Ecosystem Water Quality

## *Problem Statements*

**Important Aquatic Habitats** are inadequate to support production and survival of native and other desirable estuarine and anadromous fish in the Bay-Delta system. Examples of fishes that have experienced declines related to changes in Delta habitat include delta smelt, longfin smelt, Sacramento splittail, chinook salmon, striped bass, and American shad. The water quality problems for specific aquatic habitats include:

**Springtime upstream relocation of estuary entrapment/null zone habitat** by low Delta outflow limits the availability of suitable rearing habitat in the estuary (e.g. delta smelt, longfin smelt, and striped).

- Saltwater intrusion into Suisun Bay reduces the bay's value as a low-salinity nursery area.
- Low salinity (less than 10 ppt) habitat is confined to deeper channels in the Western Delta where it is of limited value as compared to Suisun Bay.

**Reduced food web productivity** in aquatic habitats limits forage availability for fish species (e.g. delta smelt, longfin smelt, Sacramento splittail, chinook salmon, striped bass, starry flounder, bay shrimp, and neomysis).

- High concentration of toxicants in the water column and in sediments reduces production and survival of aquatic plants and invertebrates.
- Reduced residence time of water in Delta channels limits plankton blooms.
- Reduction in nutrient inputs from wetland and riparian habitats limits aquatic productivity.
- High salinity levels in Delta aquatic habitats limit seasonal productivity patterns of estuarine food-chain organisms.
- Reduction and seasonal shift of freshwater inflow to the Delta directly limits primary and secondary productivity of the estuary during critical periods.

**Excessive concentrations of toxic constituents and their bioaccumulation** directly limits survival and growth of desirable fish, wildlife, and other species (e.g. delta smelt, longfin smelt, Sacramento splittail, chinook salmon, striped bass, starry flounder, rails, avocets, grebes).

- Excessive pesticide residues directly affect some fish and wildlife species.
- Excessive hydrocarbons, heavy metals, and other pollutants directly harm some fish and wildlife species.

**Important Wetland Habitats** are inadequate to support productions and survival of wildlife species in the Bay-Delta system. The problems for the specific wetland habitats include:

**Lack of brackish tidal marsh habitats** of high quality limits supportable populations of wildlife species that inhabit them (e.g. Suisun Slough thistle, Suisun song sparrow, and snowy egret).

- Altered vegetation composition in brackish marshes caused by changes in salinity levels limits habitat suitability for some species.

**Lack of freshwater habitats** of high quality limits supportable populations of native plant and wildlife species (e.g. giant garter snake, tri-colored blackbird, and Mason's lilaeopsis).

- Inappropriate increased salinity levels do not support desirable vegetation composition and thereby limit habitat suitability for some species.

**Populations of Some Species of Plants and Animals** dependent on the Delta have declined.

- Many species in the Bay-Delta system have declined to the point that they are threatened, endangered, or species of special concern.
- Many species of economic importance that are dependent on the Bay-Delta system have declined.
- Some prey or food species dependent on the Bay-Delta system have declined to the point that they no longer adequately support populations of predator species.

## *Water Quality Objectives*

**Improve and Increase Aquatic Habitats** so that they can support the sustainable production and survival of native and other desirable estuarine and anadromous fish in the estuary.

**Improve the productivity of the Bay-Delta aquatic habitat food web** to support sustainable populations of desirable fish (and other) species.

- Reduce concentrations of toxicants in the water column and in sediments.
- Increase the residence time of water in Delta channels to increase plankton productivity and reduce undesirable algal-mat growth in the Delta.
- Increase the input of nutrients from wetland and riparian habitats to aquatic habitats.
- Reduce salinity levels in Delta aquatic habitats.
- Increase flows of freshwater into the estuary.

**Reduce concentrations of toxic constituents and their bioaccumulation** to eliminate their adverse effects on populations of fish and wildlife species.

- Reduce the concentrations of pesticide residues in Bay-Delta system water and sediments.
- Reduce the concentrations of hydrocarbons, heavy metals, and other pollutants in Bay-Delta system water and sediments.

**Improve and Increase Important Wetland Habitats** so that they can support the sustainable production and survival of wildlife species.

**Increase the amount of high quality brackish tidal marsh habitat** in the Bay-Delta system to better support sustainable populations of native wildlife species.

- Modify salinity levels in brackish tidal marshes to improve their vegetation composition.

**Increase the amount of high quality freshwater marsh habitat** to better support sustainable populations of native wildlife species in the Delta.

- Restore appropriate salinity levels in freshwater marsh habitat in the Delta to enhance forage productivity and habitat suitability for some native species.

**Increase Population Health and Population Size** of Delta species to levels that assure sustained survival.

**Contribute to the recovery** of threatened, endangered or species of special concern.

**Increase populations** of economically important species.

**Increase populations** of prey or food species.